Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

MICROSCOPY.[1]

Method of Photographing Serial Sections.—The development of microtomical technique has made it a comparatively easy matter to produce great numbers of fine sections in a very short time. As the sections with which an anatomist or an embryologist has to deal are generally too small for macroscopical examination, it is often difficult to obtain an outlook over the material accumulated. The microscopical examination of hundreds or thousands of serial sections, if only for the purpose of general orientation, is a slow and tedious work. One cannot carry the picture of the series along while examining the sections, one by one, with the microscope. This can only be accomplished indirectly, through representations enlarged just enough to make it easy to examine them macroscopically. To make outline sketches of the whole series, or at least of the more important portions of it, calls for an enormous sacrifice of time, together with a large amount of most fatiguing mechanical labor. Much more satisfactory results may be obtained by the aid of photography, and with relatively little expenditure of time and energy.

Professor His,[2] of Leipzig, to whom we are indebted for the "embryograph" and a method of "plastic reconstruction," previously described in this journal, employs the apparatus seen in the accompanying cut for photographing serial sections.

The objective (Ob) is a Steinheil *antiplanatic* of 12 cm. focal distance, or an *aplanatic* of the same factory of 14 cm. focal distance. The latter gives a little less light than the former, but possesses the advantage of an accurate and uniformly-sharp definition.

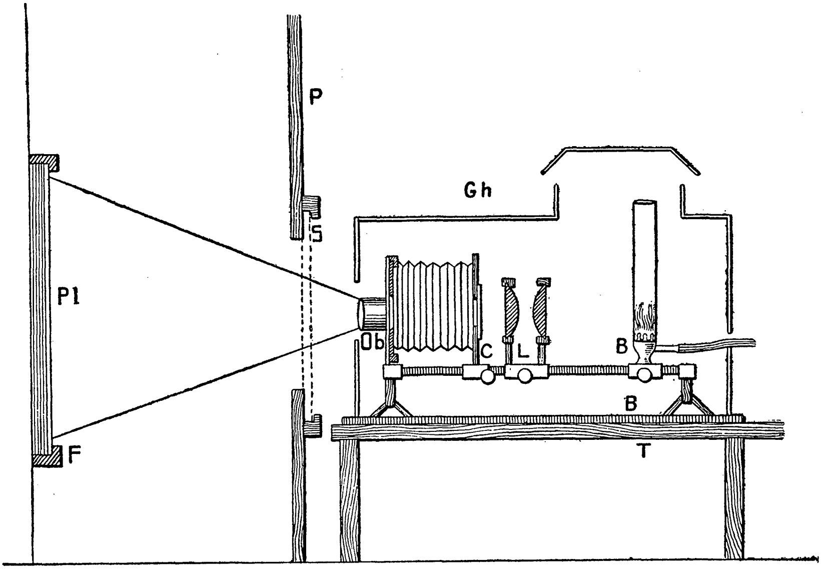
For embryos that are not exceptionally small, a magnification of ten to fifteen diameters generally suffices. With any magnification not exceeding twenty diameters all the sections mounted under a cover-glass 3 cm. square can be reproduced at the same time. Long series of sections can thus be photographed in a short time, and the material so obtained is invaluable, not only as a means of general orientation, but also as a reliable basis for "plastic reconstruction" of every kind.

The projection-apparatus consists of a horizontal rack carrying at the anterior end a plate with the photographic objective (Ob); behind this a second plate (C) (with a central perforation), connected with the first by a bellows, and serving as a carrier for the object-slide; then a double condenser (L) 11.5 cm. in diameter, with a focal distance of 8 cm.; and, behind all, an argand gas-burner (B).

---

[1] Edited by C. O. WHITMAN, Ph.D., Milwaukee, Wisconsin.

[2] W. His, "Ueber das Photographiren von Schnittreihen;" Arch. f. Anat. u. Phys., Anat. Abth., 1887, 2d and 3d Heft, p. 174.



The rack bearing all these parts has two feet resting on a base-board (B), which can slide forward or backward between guides on the table (T). The coarse adjustment is effected, first of all, through this sliding movement of the base, and then by a screw-movement of the object-carrier (C). The fine adjustment is made by turning the objective, which works in a fine screw. Extraneous light is excluded by inclosing the whole apparatus in a tin box (Gh) provided with a wide side-door.

The size and distance of the picture vary within relatively large dimensions, so that an ordinary photographic camera could not conveniently be employed. The arrangement is such that the picture is projected upon the wall of the dark-room, in front of the objective, instead of a ground-glass behind it, as in the ordinary camera.

The dark-room is divided by a partition (P), which is provided with a door and a sliding screen (S). On the wall opposite the screen is fixed a large frame (F), which carries a glass plate (Pl). The image is first brought to a focus on a sheet of white paper behind the glass plate; and then, after closing the screen, the white paper is replaced by the photographic paper.

The photographic paper, known as the "Eastman bromide-of-silver paper," is sensitive enough for use with lamp-light, and the manipulations are extremely simple.

The time of exposure varies according to the magnification and the diaphragm employed. With the Steinheil aplanatic and diaphragm (4) an amplification of ten diameters requires an exposure of six to eight minutes. Very thin, transparent sections require less time than thick or deeply-stained ones.

The pictures are, of course, negative, but they are none the less valuable for the purposes before named. If positive pictures are desired these are easily obtained, as the photographic paper is sufficiently transparent to admit of copying. For this purpose lamp-light is better than sunlight, and an exposure of one-half to one minute is sufficient. Both the negative pictures and the positive copies admit of further finish with pencil or color.

Full details of manipulation are furnished with each package of the Eastman paper. The operations which follow exposure are (1) softening of the paper in water; (2) development of the picture by means of potassium oxalate and ferrous sulphate; (3) washing in acidified water; (4) fixation through hyposulphite of sodium; (5) washing and drying.

SCIENTIFIC NEWS.

—In the November number of the AMERICAN NATURALIST Mr. J. F. James kindly calls my attention and that of the general public to what seems to be a slight put upon his work. A word of explanation seems to be due both to Mr. James and myself. The object of the paper entitled "Origin of the Indiana Flora" was simply to apply well-known facts with regard to the North American flora to the specific case of Indiana. In order to do this it seemed necessary to give an introduction containing an explanation of the general problem for those for whom the writing was intended,—a thing that would not have been necessary for the scientific public. My former assistant, Mr. Thomson, was asked to look up the literature of the subject and prepare as compact a statement as possible of the known facts. I suppose that he found Mr. James's paper useful, as being the most concise compilation of facts so well known as to have become general property. That due credit was not given to Mr. James for this assistance was a great oversight, but that it could not have been intentional appears in the very extracts that Mr. James has culled out. He is there mentioned by his full name as an authority for some statement or other. I am blameworthy for not more closely inspecting this part of the work, but, as the chief trouble was failure to give full credit to Mr. James, it is hereby done, with an expression of regret that the omission was not seen in time to remedy it.—*John M. Coulter.*

—The Imperial University of Japan has recently established a marine biological station at Misaki, a day's journey from Tokio, an account of which has recently been published by Professor Milsukuri in vol. i. of the *Journal of the College of Science* of the